

- a) Set the temperature of the crucible to 700~750℃ and start heating. Preheat the raw materials in an oven at 140~200℃, and dry the covering flux at the same time. The quantity of the flux is 0.6~4 wt% of total weight of the alloy. Preheat the casting mold in another oven at 200~400℃;
  - b) When the temperature of the crucible rise up to 280~320℃, introduce the CO<sub>2</sub> gas into the crucible to replace the air, put 30%~50% of the preheated covering flux into the bottom of the crucible, then put the preheated pure magnesium ingot into the crucible;
  - c) After the melting of the pure magnesium ingot, while the temperature of the melting rise up to 700~750℃, introduce other preheated raw materials into the melting in turn from high melting point one to low melting point one, and then stir the melting for 8~10 minutes; In this step, put some of the residual preheated covering flux onto the top of the melting to prevent combustion of the melting;
  - d) After stabilizing the melting at 700~750℃ for 4~6 minutes, remove the scum from the top of the melting; In this step, introduce the mixed protective gases, which has composition of 99~99.5vol% air or CO<sub>2</sub> plus 0.5~1vol%SF<sub>6</sub>, to prevent the melting from combustion;
  - e) After scumming, while maintaining the temperature of the melting at 700~750℃, cast the melting into the preheated mold under the protection of mixture protective gases, which has composition of 99~99.5vol% air or CO<sub>2</sub> plus 0.5~1vol%SF<sub>6</sub>.
5. The preparation method of the high strength and high ductility magnesium alloy magnesium alloy according the Claim 4, characterized in that wherein the heat treatments adopted here are classified into three types: solution heat treatment, artificial aging without solution treatment, artificial aging after solution treatment.
  6. The preparation method of the high strength and high ductility magnesium alloy magnesium alloy according the Claim 5, characterized in that wherein the solution heat treatment shall be handled at 340~400℃, and the heating duration shall be 8~24 hours.
  7. The preparation method of the high strength and high ductility magnesium alloy magnesium alloy according the Claim 5, characterized in that wherein the artificial ageing shall be carried out at 70~200℃, and the heating duration can be 8~24 hours.
  8. The preparation method of the high strength and high ductility magnesium alloy magnesium alloy according the Claim 5, characterized in that wherein the alloy could be prepared by permanent casting, or sand casting, die casting, squeeze casting.

## Abstract

The present invention relates to a high strength and high ductility magnesium alloy and its preparation method. The magnesium alloy in the